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## Oklahoma Groundwater Law: When Can Oil Companies Use Fresh Groundwater in Secondary Oil Recovery

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## OKLAHOMA GROUNDWATER LAW: WHEN CAN OIL COMPANIES USE FRESH GROUNDWATER IN SECONDARY OIL RECOVERY?

### I. INTRODUCTION

It is the year 2020. The surface owner<sup>1</sup> of Blackacre, a large tract of land in the Oklahoma Panhandle, engages in dry land farming. In order to irrigate his crops, the surface owner wants to pump fresh groundwater from the Ogallala Aquifer<sup>2</sup> (Ogallala). Additionally, there is a mineral owner<sup>3</sup> of Blackacre who leases the mineral estate to an oil producer. The producer has one well on Blackacre which is producing very little oil. To increase production, the producer proposes to pump fresh groundwater from the Ogallala for use in secondary oil recovery operations.

There is a problem, however. Since 1977, more than fifty percent of the Ogallala's water supply has been depleted.<sup>4</sup> In addition, an energy

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1. There may be a separation of the mineral estate or mineral rights of a piece of real property from the surface estate. *Bodcaw Lumber Co. v. Goode*, 160 Ark. 48, 55, 254 S.W. 345, 347 (1923). The Arkansas court stated that "there may be such separation, and that mineral rights, even those including gas . . . may be the subject-matter of a separate sale or reservation. . . ." *Id.*

2. Under the former Oklahoma Ground Water Law, OKLA. STAT. tit. 82, § 1002 (1971), the term "groundwater" meant "water under the surface of the earth regardless of the geologic structure in which it is standing or moving." Under the new Oklahoma Groundwater Law, OKLA. STAT. tit. 82, § 1020.1(A) (1981), the term groundwater means "water under the surface of the earth regardless of the geologic structure in which it is standing or moving outside the cut bank of any definite stream."

Groundwater is sometimes referred to as "subterranean." There are two types of subterranean waters: "percolating" and "underground streams." See *Canada v. City of Shawnee*, 179 Okla. 53, 54, 64 P.2d 694, 696 (1937). The Oklahoma Supreme Court stated, "[p]ercolating waters are those which seep, ooze, filter, and otherwise circulate through the subsurface strata without definite channels" and "[u]nderground streams are . . . water passing through the ground beneath the surface in defined channels." *Id.* See also *Felhauer v. People*, 167 Colo. 320, 447 P.2d 986 (1968) (Subsurface channel refers to part of the alluvium beneath, underlying, and adjacent to a surface channel.).

Aquifer is defined as "[w]ater-bearing rock strata." WILLIAMS & MEYERS, *MANUAL OF OIL AND GAS TERMS* 49 (7th ed. 1987).

3. See *supra* note 1.

4. Massey & Sloggett, *Managing Groundwater in the Ogallala Aquifer for Irrigation*, 9 OKLA. CITY U.L. REV. 379, 383 (1984). The Ogallala covers several states including New Mexico, Oklahoma, and Texas. It is expected that "more than 50 percent of the quantity of water in storage in 1977 will have been used by 2020, while nearly two-thirds of the Texas supply will be used during the period." *Id.* See also Note, *Oil and Gas: Water and Watercourses: The Right to Use Fresh Groundwater in Waterflood Operations*, 35 OKLA. L. REV. 158 n.3 (1982) (citing OKLAHOMA

crisis, more severe than the 1970's oil shortage, has existed for quite some time. Because the Ogallala is a limited natural resource, Oklahoma law requires the surface owner and the producer to apply for permits from the Oklahoma Water Resources Board (Board) before withdrawing groundwater from the Ogallala.<sup>5</sup> In deciding whether to issue these permits, the Board must use criteria set out in the Oklahoma Groundwater Law.<sup>6</sup> Under the present Oklahoma Groundwater Law, the Board's decision about issuing groundwater permits depends on whether irrigation and secondary oil recovery can be classified as waste.<sup>7</sup> However, after examining Oklahoma case law and the methods used by other Ogallala states for apportioning groundwater, it is apparent that the waste test is not the best method for determining whether oil companies should be given permits for using fresh groundwater in secondary oil recovery operations.

## II. BACKGROUND

### A. Oklahoma Groundwater Law

Under the old Oklahoma Groundwater Law,<sup>8</sup> groundwater use was regulated on a conservation basis.<sup>9</sup> In 1972, the Oklahoma Legislature

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WATER RESOURCES BD., OKLAHOMA COMPREHENSIVE WATER PLAN, 72, 73 (1980)). The ground water supply in Oklahoma is becoming depleted because:

The natural recycle of water into the underlying rock formations from precipitation and seepage along stream beds is not sufficient in western Oklahoma. To make agricultural operations economically feasible, farmers in this area must pump more water out of the ground than is naturally flowing back into underground storage. Such mining or over-drafting of the groundwater supplies threatens to deplete the supply within the foreseeable future.

During the 1950s, the surge in irrigated agriculture in western Oklahoma resulted in declines in the water table of five to ten feet per year. In the Oklahoma Panhandle, wells that had yielded 1,000 gallons per minute now produce only 500 to 800 gallons per minute. Water wells must be drilled deeper as the groundwater supply diminishes. Water encountered 250 feet below the surface twenty years ago now requires drilling to a depth of 350 feet or more.

To pump water from greater depths requires more fuel. As energy costs soar, many farmers and cattlemen are unable to afford the rising costs of irrigation. Although water may be available at greater depths, technological and economic restraints may prevent its use, and the aquifer can be considered effectively depleted.

*Id.*

5. See *infra* notes 12-21 and accompanying text.

6. OKLA. STAT. tit. 82, §§ 1020.1 -22 (1981). See also *infra* notes 19-21 and accompanying text.

7. OKLA. STAT. tit. 82, § 1020.15 (1981).

8. OKLA. STAT. tit. 82, § 1001.19 (1971).

9. Oklahoma Water Resources Bd. v. Texas County Irrigation & Water Resources Ass'n, 711 P.2d 38, 41 (Okla. 1984). The Oklahoma Supreme Court described the 1949 Act in the following manner: "The 1949 Act defined 'critical ground water area' as any ground water basin or subdivision thereof 'not having sufficient ground water to provide a reasonably safe supply for domestic,

revised the Oklahoma Groundwater Law and adopted a utilization approach.<sup>10</sup> Now, the amount of groundwater used in Oklahoma is controlled by "use regulation and management."<sup>11</sup> In order to control and manage the amount of water pumped from the ground, the Oklahoma Groundwater Law requires users to obtain permits from the Board before extracting the water.<sup>12</sup> The Oklahoma Groundwater Law provides for three types of permits: temporary, regular, and special.<sup>13</sup> Both regular and temporary permits authorize the use of groundwater for any beneficial purpose other than domestic use.<sup>14</sup> Currently, the Board only issues temporary permits which have the same effect as regular permits. The Board cannot issue regular permits until it completes a hydrologic survey determining the maximum yield of Oklahoma groundwater basins or subbasins.<sup>15</sup> A temporary permit grants the user "two (2) acre-feet [of

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municipal, industrial, irrigational, recreational, and other beneficial uses in the basin at the then current rates of withdrawal.'" *Id.* at 41 n.1 (citation omitted). *See also* Bowles v. City of Enid, 206 Okla. 611, 616, 245 P.2d 730, 735 (1952). The policy of the old groundwater law was "to conserve and protect the ground water resources of the State and for that purpose to provide reasonable regulations for the taking and use of ground water." *Id.* (quoting OKLA. STAT. tit. 82, § 1003 (1951)).

10. The 1972 Act, OKLA. STAT. tit. 82, § 1020.2 (1981), provides the policy behind the present groundwater law:

It is hereby declared to be the public policy of this state, in the interest of agricultural stability, domestic, municipal, industrial and other beneficial uses, general economy, health and welfare of the state and its citizens, to *utilize* the groundwater resources of the state, and for that purpose to provide reasonable regulations for the allocation for reasonable use based on hydrologic surveys of fresh groundwater basins or subbasins to determine a restriction on the production, based upon the acres overlying the groundwater basin or subbasin. The provisions of this act shall not apply to the taking, using or disposal of salt water associated with the exploration, production or recovery of oil and gas or to the taking, using or disposal of water trapped in producing mines.

*Id.* (emphasis added).

11. *Oklahoma Water Resources Bd.*, 711 P.2d at 41.

12. OKLA. STAT. tit. 82, § 1020.7 (1981) provides that:

Any person intending to use groundwater shall, after his testing is completed, make application to the Board for an appropriate permit as provided in Section 11 before commencing any drilling for such purposes and before taking water from any completed well heretofore drilled. Such application to take and use groundwater shall be on a form provided by the Board and pursuant to the rules and regulations established by the Board. The application heretofore filed with the Board shall be used in granting permits for existing wells and the Board shall publish the notice of the hearing thereon.

*Id.* (footnote omitted). For the authority allocated to the Oklahoma Water Resources Board, see OKLA. STAT. tit. 82, §§ 1085.1-86.6 (1981).

13. OKLA. STAT. tit. 82, § 1020.11 (1981).

14. *Id.* § 1020.11(A), (B).

15. *Id.* § 1020.11(B). This section states that: "A temporary permit is an authorization for the same purposes as a regular permit but granted by the Board prior to the completion of the hydrologic survey and the determination of the maximum annual yield of the basin or subbasin." *Id.*

"Groundwater basin" is defined as, "a distinct underground body of water overlain by contiguous land and having substantially the same geological and hydrological characteristics and yield capabilities." *Id.* § 1020.11(C).

"Subbasin" is defined as, "a subdivision of a water basin overlain by contiguous land and having

groundwater] annually for each acre of land owned or leased by the applicant" and must be revalidated on an annual basis.<sup>16</sup> Regular permits, on the other hand, do not have to be revalidated and are issued according to the individual applicant's "proportionate part of the maximum annual yield of the basin or subbasin."<sup>17</sup> Special permits are issued in the place of regular or temporary permits when applicants need groundwater for beneficial uses requiring larger quantities of water than those allocated under regular or temporary permits.<sup>18</sup>

When the Board reviews applications for permits, the Oklahoma Groundwater Law requires the Board to look at two main criteria: (1) whether the applicant's proposed use of the water is beneficial<sup>19</sup> and (2) whether the groundwater user will be committing waste.<sup>20</sup> Both criteria must be met by groundwater users such as oil companies who seek to use groundwater in secondary recovery operations.<sup>21</sup>

#### B. *Why Oil Companies Use Fresh Groundwater in Secondary Recovery Operations*

The duration of an oil and gas lease is controlled by the lease provisions.<sup>22</sup> An oil and gas lease is broken down into a primary term<sup>23</sup> and a

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substantially the same geological and hydrological characteristics and yield capabilities." *Id.* § 1020.11(D).

16. *Id.* § 1020.11(B).

17. *Id.* § 1020.9.

18. *Id.* § 1020.11(C). See *Lowrey v. Hodges*, 555 P.2d 1016 (Okla. 1976) (court held that irrigation for growing crops is beneficial use).

19. OKLA. STAT. tit. 82, § 1020.9 (1981). See *Lowrey*, 555 P.2d at 1023 (If applicant's plan does not demonstrate waste on its face, the individual protesting the application has the burden of proving that waste will occur.).

20. OKLA. STAT. tit. 82, § 1020.15 (1981).

21. *Id.* § 1020.1. This section lists actions which constitute waste. Use of groundwater in secondary oil recovery operations is not included in this list.

22. But see *Champlin Petroleum Co. v. Ingram*, 560 F.2d 994 (10th Cir. 1977), *cert. denied*, 436 U.S. 958 (1978) (ambiguity under oil and gas lease should be resolved in favor of lessor when two or more equally reasonable constructions exist); *Probst v. Ingram*, 373 P.2d 58 (Okla. 1962) (oil and gas lease governed by different rules than those for construction of contracts and conveyances, and is most strongly construed against lessee). See also *State ex rel. Comm'rs of Land Office v. Couch*, 298 P.2d 452 (Okla. 1956); *Beatty v. Baxter*, 208 Okla. 686, 258 P.2d 626 (1953); *Magnolia Petroleum Co. v. Vaughn*, 195 Okla. 662, 161 P.2d 762 (1945); *Doss Oil Royalty Co. v. Texas Co.*, 192 Okla. 359, 137 P.2d 934 (1943); *Crain v. Pure Oil Co.*, 25 F.2d 824 (8th Cir. 1928); *Garfield Oil Co. v. Champlin*, 78 Okla. 91, 189 P. 514 (1920).

23. WILLIAMS & MEYERS, *supra* note 2, at 746-47, defines "primary term" as:

The period of time, typically five or ten years, during which a lease may be kept alive by a lessee even though there is no production in paying quantities by virtue of drilling operations on the leased land or the payment of rentals. After the expiration of the primary term, the lease usually can be kept alive only by PRODUCTION IN PAYING QUANTITIES. . . .

secondary term.<sup>24</sup> In Oklahoma, oil leases usually provide that the lease will continue after expiration of the primary term into the secondary term so long as oil continues to be produced in "paying quantities."<sup>25</sup> Thus, an oil company lessee's well must still be a producer if the lease is to be perpetuated.<sup>26</sup>

To prevent expiration of a lease in its secondary term, when a well's natural energy is becoming exhausted, oil companies will sometimes inject water into the mineral formation (a process sometimes referred to as "waterflooding"<sup>27</sup>) to increase the amount of hydrocarbons recovered.<sup>28</sup> To do this, an oil company must either bring water in from a source external to the lease or use water available on the leased premises. Sometimes saltwater is readily available for waterflooding. However, use of saltwater in secondary operations is not always effective because it can plug a producing well.<sup>29</sup> Saltwater can also be too expensive to use.<sup>30</sup>

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WILLIAMS & MEYERS, *supra* note 2, at 746-47.

*See also* Winn v. Nilsen, 670 P.2d 588 (Okla. 1983) (computation of duration of primary term); Wehran v. Helis, 152 So. 2d 220 (La. Ct. App. 1963) (computation of length of primary term).

24. The secondary term of an oil lease is described as "[t]he period subsequent to the expiration of the primary term during which the lease or deed is continued in force by operation of the THEREAFTER CLAUSE (*q.v.*) of the lease or deed." WILLIAMS & MEYERS, *supra* note 2, at 888.

25. The U.S. Court of Appeals in Whitaker v. Texaco Inc., 283 F.2d 169 (10th Cir. 1960), stated that "[w]hen the term 'paying quantities' is used in connection with the continuation of a lease under a 'thereafter' clause. . . . [t]he Oklahoma rule is that . . . 'if the well pays a profit even though small, over operating expenses, it produces in paying quantities, though it may never repay its costs, and the operation [of the well] as a whole may prove unprofitable.'" *Id.* at 176 (citing Henry v. Clay, 274 P.2d 545, 546 (Okla. 1954)).

26. The U.S. Court of Appeals in Continental Oil Co. v. Osage Oil & Refining Co., 69 F.2d 19 (10th Cir. 1934) stated that:

Where a lease is for a definite term and "so long thereafter as oil is found in paying quantities," the lease expires by its own terms at the end of such term if the lessee is not then producing oil therefrom in paying quantities, except in cases where he is prevented from so doing by an act of the lessor.

*Id.* at 23.

For other states' definitions of what constitutes production in paying quantities, see Champlin Petroleum Co. v. Mingo Oil Producers, 628 F. Supp. 557 (D. Wyo. 1986), *aff'd*, 841 F.2d 1131 (10th Cir. 1987); Pray v. Premier Petroleum, Inc., 233 Kan. 351, 662 P.2d 255 (1983); Reese Enterprises v. Lawson, 220 Kan. 300, 553 P.2d 885 (1976).

27. Waterflooding is "[o]ne method of SECONDARY RECOVERY (*q.v.*) in which water is injected into an oil reservoir for the purpose of washing the oil out of the reservoir rock and into the bore of a producing well." WILLIAMS & MEYERS, *supra* note 2, at 1062.

28. WILLIAMS & MEYERS, *supra* note 2, at 886. *See also* Tidewater Oil Co. v. Penix, 223 F. Supp. 215, 216 (E.D. Okla. 1963), where the Federal District Court stated that "secondary recovery of oil by waterflooding [is] a common practice in the State of Oklahoma." *Id.* The court concluded that "by the general terms [of the oil lease] the Lessee not only ha[s] a right, but ha[s] a duty, to waterflood the premises for the recovery of oil for the benefit of the mineral owners should it be determined by a prudent operator to be profitable." *Id.* at 217.

29. The term "plug" as used in this instance means "[t]o stop the flow of water, gas or oil from one stratum to another. . . ." WILLIAMS & MEYERS, *supra* note 2, at 724. The term does not refer to the type of plugging associated with the abandonment of a well.

Furthermore, not all leases contain surface freshwater, and it is not always clear when oil and gas lessees can legally use such water.<sup>31</sup> Fresh groundwater is the next most feasible alternative in instances where saltwater will not work and surface freshwater is not available.<sup>32</sup>

### C. *Problem of Apportioning the Limited Amount of Fresh Groundwater Available*

Since 1980, at least one to three acre-feet per year of fresh groundwater has been pumped from the Ogallala for the irrigation of growing crops alone.<sup>33</sup> This rate of extraction has caused a severe decline in the Ogallala's groundwater level because the "recharge rate by percolation from rainfall rarely exceeds one acre-inch per acre per year."<sup>34</sup> Extraction from the Ogallala for irrigation purposes, however, accounts for only one use of the groundwater. Some other competing uses include water for livestock,<sup>35</sup> domestic use,<sup>36</sup> and waterflooding operations.<sup>37</sup>

30. See *Sun Oil Co. v. Whitaker*, 483 S.W.2d 808, 812 (Tex. 1972). See also Note, *supra* note 4, at 159 n.8.

31. *Holt v. Southwest Antioch Sand Unit*, Fifth Enlarged, 292 P.2d 998, 1000 (Okla. 1955) ("Whether the conveyance or reservation of the minerals provides therefore or not 'an owner of minerals may \* \* \* use such amounts of water from the land as is reasonably necessary to develop the mineral rights.'" (quoting 58 C.J.S. *Mines and Minerals* § 159 (1955)); *Mohawk Drilling Co. v. Wolf*, 262 P.2d 892 (Okla. 1953) (court disallowed oil lessee's use of water from lessor's artificial stock pond created for agricultural purposes, however, the court indicated that oil lessees can use "riparian waters" located on leases); *Vogel v. Cobb*, 193 Okla. 64, 141 P.2d 276 (1943) (court said lease stating that oil and gas lessee could use "water produced on said land for its operations thereon" didn't mean lessee could use water for supply houses not located on lease); *Arnold v. Adams*, 174 Okla. 57, 61, 294 P. 142, 146 (1930) (lease stated, "[l]essee shall have the right to use, free of cost, gas, oil and water produced on said land for its operation thereon, except water from wells of lessor." Clearly this does not mean that lessee was entitled to use water from the private pond or tank of lessor. . . .").

32. See *Ricks Exploration Co. v. Okla. Water Resources Bd.*, 695 P.2d 498 (Okla. 1984) (oil and gas lessee has right to use groundwater for development of mineral estate); *Mack Oil Co. v. Laurence*, 389 P.2d 955, 961-62 (Okla. 1964) ("[C]onveyance of the surface [which] carried with it both the soil and underground water did not invest plaintiff (grantee) with such possessory right therein as to deprive holders of the mineral rights herein conveyed to use of water found under the land for purposes necessary and incidental to its own operations thereon.").

33. See Massey & Sloggett, *supra* note 4, at 379. The Ogallala Aquifer extends "over parts of six states - Colorado, Kansas, Nebraska, New Mexico, Oklahoma and Texas." Massey & Sloggett, *supra* note 4, at 379.

34. Massey & Sloggett, *supra* note 4, at 381.

35. Massey & Sloggett, *supra* note 4, at 384. Statistics indicate that "[c]urrently, the Ogallala area produces more than 38 percent of the nation's total value of livestock." Massey & Sloggett, *supra* note 4, at 384.

36. See OKLA. STAT. tit. 82, § 1020.3 (1981) which states that, "[a]ny landowner has a right to take groundwater from land owned by him for domestic use without a permit. Wells for domestic use shall not be subjected to well spacing orders, but are subject to sanctions against waste." See also *Hodges v. Oklahoma Water Resources Bd.*, 580 P.2d 980, 983 (Okla. 1978) ("[T]he statutes (82 O.S.Supp. 1972, §§ 1020.1, et seq.) do not require the Board to consider domestic priorities before granting a permit. We now hold that the fact that it is not necessary to obtain a permit before taking

As the use of the Ogallala increases and the amount of available groundwater decreases,<sup>38</sup> users of this limited resource will become increasingly antagonistic. Oklahoma lawmakers will then be forced to choose who will be given permits for groundwater extraction. Agricultural users will argue that too many permits given to mineral owners and oil lessees will leave an insufficient supply of water for irrigation purposes, thus damaging Oklahoma's agricultural economy. Farmers and ranchers will also argue that groundwater use in secondary oil recovery operations constitutes waste because after the water is injected into a mineral reservoir, it may be lost forever.<sup>39</sup> Chemical additives used in waterflooding operations can also contaminate the water so much that it cannot be applied to other beneficial uses.<sup>40</sup> Lastly, as the aquifer becomes depleted, the quality of the water will deteriorate.<sup>41</sup>

Oil company lessees, on the other hand, will point out that farmers need petroleum products to run their farming equipment. In addition, farmers need oil and gas to supply the energy necessary for the electric pumps which they use to withdraw fresh groundwater from their water wells.<sup>42</sup> Use of groundwater in irrigation operations can also be considered waste because when crops are watered, the water combines with chemicals from fertilizers making it impossible to reuse the water.

Presently, applicants for groundwater permits, including farmers and oil companies, must prove that their proposed use is beneficial and not wasteful. This standard, however, will be insufficient to settle future disputes as to who will receive permits. A better test would be to require applicants to prove that their proposed use is beneficial and will not impair an already-existing right to use groundwater from the same source.<sup>43</sup>

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water for domestic use does not give water for domestic use a priority over water put to other beneficial use."'). See also Jensen, *The Allocation of Percolating Water Under the Oklahoma Ground Water Law of 1972*, 14 TULSA L.J. 437, 460-61 (1979).

37. See *supra* notes 22-32 and accompanying text.

38. See Massey & Sloggett, *supra* note 4, at 381.

39. See Note, *Oil and Gas: Water and Water Courses: The Right to Use Ground Water in Oil and Gas Production in Oklahoma*, 22 OKLA. L. REV. 99, 104 (1969).

40. Comment, *Fresh Groundwater and Tertiary Oil Recovery: Oklahoma Water Resources Board v. Texas County Irrigation & Water Resources Association (Mobil Oil Corp.)*, 21 TULSA L.J. 565, 578-79 n.117 (1986).

41. See Massey & Sloggett, *supra* note 4, at 383-84, where it is contemplated that "[l]arge withdrawals for irrigation purposes, especially in areas with low transmissivity, may lower the head sufficiently to induce upward migration of water high in chloride from lower aquifers, reducing the quality of water available for irrigation."

42. See Comment, *supra* note 40, at 565.

43. See *infra* notes 160-62 and accompanying text.



## III. CASE LAW

A. *Oklahoma Case Law*

Users of groundwater from the Ogallala must submit applications for groundwater permits to the Oklahoma Water Resources Board (Board). After receiving the application, the Board conducts a hearing to decide whether to issue the applicant a permit. During the hearing, the Board must determine whether the proposed use is beneficial and whether the proposed use is waste.<sup>44</sup> The following cases represent Oklahoma Supreme Court review of Board decisions concerning permits. In each dispute, the Oklahoma Supreme Court faced the issue of whether a proposed use of fresh groundwater was waste. The court refused in each instance, however, to determine whether the proposed use was or was not waste.

1. *Lowrey v. Hodges*

A defendant's application for a permit which proposed to utilize 320 acre-feet of the Ogallala's fresh groundwater for irrigation purposes was challenged in *Lowrey v. Hodges*<sup>45</sup> by plaintiffs who alleged that such use would be waste.<sup>46</sup> The Lowreys wanted to use the water on their 160-acre farm in Beaver County, Oklahoma.<sup>47</sup> The Hodges alleged that "the granting of [the] permit would endanger the water level [and] that the water would be drained from under [their] properties."<sup>48</sup>

The Board heard the dispute on September 13, 1974 and the Hodges' motion to dismiss the application was denied.<sup>49</sup> On October 8, 1974, the Board granted the Lowreys a temporary permit.<sup>50</sup> At that

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44. See *supra* notes 19-21 and accompanying text.

45. 555 P.2d 1016 (Okla. 1976).

46. *Id.* at 1018.

47. *Id.*

48. *Id.* at 1019.

49. *Id.* After the September 13, 1974, hearing, another protest was filed by the towns of Forgan and Beaver, Oklahoma. However, the towns did not meet the writing and filing requirements for protests under the law. *Id.*

50. *Id.* The factors that the Board must consider at a hearing before granting a permit are set forth in OKLA. STAT. tit. 82, § 1020.9 (1981):

At the hearing, the Board shall determine from the evidence presented by the parties interested, from the hydrologic surveys and from other relevant data available to the Board and applicant, whether the lands owned or leased by the applicant overlie the fresh groundwater basin or subbasin and whether the use to which the applicant intends to put the water is a beneficial use. If so, and if the Board finds that waste will not occur, the Board shall approve the application by issuing a regular permit. A regular permit shall allocate to the applicant his proportionate part of the maximum annual yield of the basin or subbasin. His proportionate part shall be that percentage of the total annual yield of the basin or subbasin, previously determined to be the maximum annual yield . . . which is equal to the

time, the Board made several findings of fact addressing issues brought up by the Hodges' protest, including the conclusion that there was insufficient evidence to show that the Lowrey's proposed use would waste fresh groundwater.<sup>51</sup>

After the Board conducted the hearing in which it granted a permit to the Lowreys, the Hodges filed a petition for review with the Oklahoma County District Court.<sup>52</sup> On the issue of waste, the trial court disagreed with the Board finding that there was not enough evidence to show that waste would not occur, thus rendering the Board's findings inadequate.<sup>53</sup>

On appeal, the Oklahoma Supreme Court reversed the district court's decision and addressed the waste issue.<sup>54</sup> The court concluded "that no evidence was offered to show that waste would or was likely to occur if [the Lowrey's] permit was granted."<sup>55</sup> In reaching this decision, the court pointed out that before receiving a permit an applicant must first demonstrate the method of irrigation that they intend to use in a particular area, and then it is the Board's duty to determine from this information whether waste will occur.<sup>56</sup> The party protesting the application has the burden of coming forth with evidence of waste.<sup>57</sup> Lastly, the court interpreted the Oklahoma Groundwater Law as "contemplat[ing] an after-the-fact finding of waste and set[ting] out the procedure for criminal prosecution, injunction, and suspension of a permit when

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percentage of the land overlying the fresh groundwater basin or subbasin which he owns or leases. The permit shall specify the location of the permitted well or wells. A regular permit shall not be granted for less than the remaining life of the basin or subbasin as previously determined by the Board.

*Id.* (footnote omitted).

51. *Lowrey v. Hodges*, 555 P.2d 1016, 1021 (Okla. 1976). The Hodges' written protest argued "that the withdrawal of water from the Ogallala Aquifer at this location would create waste as defined by 82 O.S. § 1020.15." *Id.* at 1019. The written protest further went on to state "that at this particular location, the Ogallala Aquifer does not replenish itself, even under the present domestic uses in the area; that the proposed well locations are too close to the property line and a minimum withdrawal of water would deplete the storage under the grounds; and, that the allowance of said permit . . . would be in violation of the Constitution of the United States and the Constitution of the State of Oklahoma and of due process of law." *Id.* at 1020.

52. *Id.* at 1021.

53. *Id.*

54. *Id.* at 1023.

55. *Id.* at 1025.

56. *Id.* at 1023.

57. *Id.* The Oklahoma Supreme Court also stated that:

If the plans submitted to the Board do not on their face demonstrate such waste, and the Protestants fail to introduce evidence to substantiate that waste will occur, and the Board finds that waste will not occur, the [Groundwater] statute has been satisfied and further questions concerning waste must await completion of the project.

*Id.*

and if it occurs."<sup>58</sup> Thus, the court seemed unwilling in its decision to conclude whether the applicant's proposed use was waste. Instead, it focused on which party has the burden of proving whether an applicant's proposed use will cause waste. In short, the court left the decision as to what constitutes a wasteful practice up to the Board.

2. *Texas County Irrigation & Water Resources Association v. Cities Service Oil Co.*

Cities Service Oil Company (Cities Service) applied for a groundwater permit in *Texas County Irrigation & Water Resources Association v. Cities Service Oil Co.*,<sup>59</sup> desiring to use fresh groundwater in a waterflood project in Texas County, Oklahoma.<sup>60</sup> Cities Service proposed pumping 235.23 acre-feet of fresh groundwater annually from the Ogallala for secondary oil recovery operations in the waterflood project.<sup>61</sup> No protest was filed against Cities Service's application before the Board's first administrative hearing on June 1, 1973.<sup>62</sup> At the Board's next meeting on July 10, 1973, the Texas County Irrigation and Water Resources Association (Association) protested Cities Service's application.<sup>63</sup> Despite the Association's protest, the Board granted Cities Service a permit.<sup>64</sup>

The Association then sought review under the Administrative Procedures Act<sup>65</sup> by the District Court of Texas County and obtained a reversal of the Board's decision to grant the permit.<sup>66</sup> The reversal was based on the trial court's conclusion that the use of fresh groundwater in waterflood operations for secondary oil recovery is waste.<sup>67</sup> Cities Service and the Board appealed the trial court's decision to the Oklahoma

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58. *Id.* See OKLA. STAT. tit. 82, § 1020.15 (1981) which mandates that:

Any employee of the Board having evidence that an act of waste is being committed in his presence, or on the filing of a complaint by another individual, shall immediately proceed to cite such violator and shall thereupon file a complaint in the district court of the county wherein such violation has occurred, and it shall be the duty of the district attorney of said county to prosecute such complaint. In addition thereto, if any person commits waste the Board shall immediately institute action to enjoin in a court of competent jurisdiction and may suspend any permit to take water as long as such waste continues.

59. 570 P.2d 49 (Okla. 1977).

60. *Id.* at 50.

61. *Id.*

62. *Id.*

63. *Id.*

64. *Id.*

65. OKLA. STAT. tit. 75, §§ 301-327 (1971).

66. *Texas County Irrigation & Water Resources Ass'n. v. Cities Service Oil Co.*, 570 P.2d 49, 50 (Okla. 1977).

67. *Id.*

Supreme Court.<sup>68</sup>

On appeal, the Board and Cities Service made a two-pronged argument regarding the waste issue. First, they argued that the use of fresh groundwater in secondary oil recovery operations is a beneficial use.<sup>69</sup> Second, they argued that such use does not constitute "per se" waste.<sup>70</sup> The Association, on the other hand, argued that the Oklahoma Groundwater Law's definition of waste "requires such fresh water use to constitute waste, without exception and under any circumstances."<sup>71</sup> To resolve this dispute, the Oklahoma Supreme Court looked to both the Oklahoma Groundwater Law's definition of waste<sup>72</sup> and the legislative intent behind the law.<sup>73</sup> The court then determined that there was no

68. *Id.*

69. *Id.* See also *supra* note 19 and accompanying text.

70. *Cities Service Oil Co.*, 570 P.2d at 50-51.

71. *Id.* at 51.

72. *Id.* Both Cities Service and the Association advocated that the definition of waste contained in OKLA. STAT. tit. 82, §§ 1001-1018 (1971) applied instead of the distinction found in OKLA. STAT. tit. 82, §§ 1020.1-1020.22 (Supp. 1973). However, the court elected not to give effect to one definition over the other insofar as both definitions were essentially the same and that neither would be dispositive of the principal issue of the case. *Id.* See also OKLA. STAT. tit. 82, § 1020.15 (1981), which states that:

The Board shall not permit any fresh groundwater user to commit waste by:

1. Drilling a well, taking, or using fresh groundwater without a permit, except for domestic use;
2. Taking more fresh groundwater than is authorized by the permit;
3. Taking or using fresh groundwater in any manner so that the water is lost for beneficial use;
4. Transporting fresh groundwater from a well to the place of use in such a manner that there is an excessive loss in transit;
5. Using fresh groundwater in such an inefficient manner that excessive losses occur;
6. Allowing any fresh groundwater to reach a pervious stratum and be lost into cavernous or otherwise pervious materials encountered in a well;
7. Permitting or causing the pollution of a fresh water strata or basin through any act which will permit fresh groundwater polluted by minerals or other waste to filter or otherwise intrude into such a basin or subbasin;
8. Drilling wells and producing fresh groundwater therefrom except in accordance with the well spacing previously determined by the Board;
9. Using fresh groundwater for air conditioning or cooling purposes without providing facilities to aerate and reuse such water; or
10. Failure to properly plug abandoned fresh water wells in accordance with rules and regulations of the Board and file reports thereof.

*Id.* (footnote omitted).

73. *Cities Service Oil Co.*, 570 P.2d at 51. The Oklahoma Supreme Court also looked at OKLA. STAT. tit. 75, § 308 (1971) to ascertain legislative intent. The court concluded that the statute reflected "a legislative intent that regardless of the circumstance, any and all use of fresh ground water for secondary oil recovery is not, of itself, 'waste' under the ground water law." *Cities Service Oil Co.*, 570 P.2d at 51. The court also looked at H.J.R. 502, 26th Leg., 1957 Okla. Sess. Law 670 which set out "five beneficial uses of water with 'providing food and fiber' having a third priority and 'increasing wealth' having the fourth priority." *Cities Service Oil Co.*, 570 P.2d at 51. The court then went on to say, "[p]resent mechanical farming coupled with energy problems forces consideration of oil production, as well as irrigation, to be in both the third and fourth priorities of beneficial uses. Irrigation needs not only fresh water, but energy to operate the irrigation pumps." *Id.*

statutory authority or legislative intent to show that use of fresh groundwater in waterflooding operations is waste per se.<sup>74</sup> Nevertheless, the court pointed out that its decision did not mean that use of fresh groundwater in secondary oil recovery operations could never be waste.<sup>75</sup> As in *Lowrey*, the Oklahoma Supreme Court again seemed hesitant to determine when the use of fresh groundwater constitutes waste.

### 3. *Oklahoma Water Resources Board v. Texas County Irrigation & Water Resources Association*

In *Oklahoma Water Resources Board v. Texas County Irrigation & Water Resources Association*,<sup>76</sup> Mobil Oil Corporation's (Mobil) application for a permit to withdraw an annual average of .744 acre-feet of groundwater from the Ogallala was protested by the plaintiffs who argued that such use constituted waste.<sup>77</sup> Mobil wanted to use the water for secondary and tertiary<sup>78</sup> waterflood operations located in Texas County, Oklahoma.<sup>79</sup> The Board granted Mobil the permit on August 16, 1979, after an administrative hearing at which the Texas County Irrigation and Water Resources Association (Association) protested Mobil's

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74. *Cities Service Oil Co.*, 570 P.2d at 51. The court pointed out that "[a] statutory construction which would lead to an absurdity will be avoided if this can be done without violating the evident legislative intent." *Id.* (citing *Wooten v. Hall*, 442 P.2d 334, 336 (Okla. 1968)). In addition, the court found that "[t]he evident legislative intent is not violated by this holding." *Id.* See also 12 Op. Att'y Gen. 205 (1980), where the Oklahoma Attorney General concurred with the *Cities Service Oil Co.* decision which concluded that use of ground water in secondary oil recovery operations does not constitute waste "per se." *Id.* at 207-08. The Attorney General's opinion stated that: "There is no statutory provision in the current ground water law today which establishes preferred or prioritized ground water uses. The current ground water law has established a policy of equal proportionate sharing among all overlying landowners." *Id.* at 208.

75. *Cities Service Oil Co.*, 570 P.2d at 51.

76. 711 P.2d 38 (Okla. 1984).

77. *Id.* at 40. Mobil estimated that its maximum withdrawal "would occur in 1993 when 1.852 acre-feet of fresh ground water would be withdrawn; minimum use would occur in 1998 when .209 acre-feet of fresh ground water would be withdrawn." *Id.*

78. Tertiary oil and gas recovery operations are, "enhanced recovery methods . . . ." WILLIAMS & MEYERS, *supra* note 2 at 997.

Enhanced recovery of crude oil requires a means for displacing oil from the reservoir rock, modifying the properties of the fluids in the reservoir and/or the reservoir rock to cause movement of crude oil in an efficient manner, and providing the energy and drive mechanism to force its flow to a production well. Chemicals or energy are injected as required for displacement and for the control of flow rate and flow pattern in the reservoir, and a fluid drive is provided to force the oil toward a production well.

WILLIAMS & MEYERS, *supra* note 2, at 997.

79. *Oklahoma Water Resources Bd. v. Texas County Irrigation & Water Resources Ass'n*, 711 P.2d 38, 40 (Okla. 1984).

application.<sup>80</sup> The Association then sought judicial review by the District Court of Texas County.<sup>81</sup> The district court partially affirmed and partially reversed the Board's decision. The court agreed with the Board that use of fresh groundwater in secondary and tertiary oil recovery operations is beneficial and not waste but further concluded that Mobil's proposal of using the water off the leased premises was an "unreasonable use of water from a critical ground water source."<sup>82</sup> The Board and Mobil appealed the trial court's decision to the Oklahoma Supreme Court.<sup>83</sup>

One of the issues analyzed by the Oklahoma Supreme Court on appeal was whether use of fresh groundwater in secondary and tertiary oil recovery operations constitutes waste.<sup>84</sup> The court pointed out that the Board's order lacked essential findings of fact which would support the conclusion that use of fresh groundwater in secondary and tertiary oil recovery is not waste.<sup>85</sup> To resolve this issue, the court first looked to the Board's Rules and Regulations<sup>86</sup> which define waste of water as "any act permitting or causing the pollution of fresh water or the use of such water in an inefficient manner or any manner that is not beneficial and is further defined [in the Oklahoma Groundwater Law]."<sup>87</sup> The court also examined its earlier decision, *Texas County Irrigation & Water Resources Association v. Cities Service Oil Co.*<sup>88</sup> Clarifying its holding, the court stated that the use of fresh groundwater in secondary oil recovery operations is not waste per se. The court explained that the *Cities Service Oil Co.* decision did not mean that there are no circumstances under which waterflooding might constitute waste.<sup>89</sup>

The court asserted that the Board only made general findings that

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80. *Id.*

81. *Id.*

82. *Id.* at 41.

83. *Id.*

84. *Id.* at 44.

85. *Id.*

86. *Id.* See also Oklahoma Water Resources Board Rules, Regulations and Modes of Procedure 9 (rev. ed. 1979).

87. *Oklahoma Water Resources Bd.*, 711 P.2d at 44. The court also consulted OKLA. STAT. tit. 82, § 926.1 (1981), which defines pollution as:

contamination or other alteration of the physical, chemical or biological properties of any natural waters of the state, or such discharge of any liquid, gaseous or solid substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

*Oklahoma Water Resources Bd.*, 711 P.2d at 44.

88. 570 P.2d 49 (Okla. 1977).

89. *Oklahoma Water Resources Bd.*, 711 P.2d at 44.

waste would not occur.<sup>90</sup> The court held that a mere recitation in the Board's findings that waste will not occur is not enough because the findings must be supported by evidence in the record.<sup>91</sup> In this case, there was evidence contrary to the Board's finding presented at the August 16 administrative hearing.<sup>92</sup> Testimony tended to show that the secondary oil recovery operations in which Mobil sought to engage required that detergent additives and polymers be mixed with the fresh groundwater so that more oil would be recovered.<sup>93</sup> Mobil did not explain at the hearing what specific chemical additives would be used, whether such chemicals were harmful, or whether water mixed with the chemicals could be purified by later recycling treatment.<sup>94</sup> The court also felt that Mobil should have proposed to the Board a method by which it could monitor, on a regular basis, the decline of the Ogallala's water level.<sup>95</sup> Therefore, the court concluded that the Board failed in its duty to make necessary and specific findings of fact as to whether Mobil's proposed use of the water would be waste.<sup>96</sup> The court then remanded the case to the Board for a rehearing to obtain evidence and make essential findings of fact in order to ensure that Mobil's proposed use would not cause waste by pollution

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90. *Id.* at 44-45. The Board's findings regarding waste stated that:

the Board acknowledges the variously related concerns and objections of protestants, the same said concerns and objections being generally that the granting of the subject application would result in waste. Respecting these objections and concerns, the Board finds and determines that such objections are not supported nor sustained by, and are contrary to, the reliable, competent, and substantial evidence presented herein, the same being as reflected by the testimony and all exhibits presented, and such objections cannot therefore be sustained.

*Id.* at 45.

91. *Id.*

92. *Id.*

93. *Id.*

94. *Id.*

95. *Id.* The court also pointed out that under Rule 820.1 of the Oklahoma Water Resources Board, Mobil should have shown:

An economic study containing the following information:

(1) A detailed analysis of the relative cost of obtaining salt water and any other feasible alternative versus the relative cost of obtaining fresh water,

(2) Total project costs and the amount of oil or gas expected to be recovered and the value expected to be realized,

(3) The estimated value of fresh water for other purposes (purposes or uses common to the area or vicinity subject of the application) as measured against the overall estimated value of the oil or gas to be recovered,

(4) The additional expense per barrel recovered if the applicant is required to use or treat salt water instead of fresh water in the recovery process, and

(5) An evaluation of other recovery methods or alternatives considered and why recovery requiring the use of fresh water was deemed to be necessary or the most feasible.

*Id.*

96. *Id.*

or by depletion.<sup>97</sup>

### B. *Approaches of Other Ogallala Aquifer States*

Other Ogallala states<sup>98</sup> have groundwater statutes similar to the Oklahoma Groundwater Law. However, not all of these states take the same approach on applications for groundwater use permits. All of these states require applicants to prove that any proposed use of the water will be beneficial, but not all require applicants to prove that their proposed use will not be waste. In those states requiring applicants to prove that waste will not occur, there is no case law on whether use of groundwater in secondary oil recovery operations is waste. This is true even in states like Oklahoma where the oil business is important to the state's economy.

#### 1. Colorado

The Ogallala lies beneath eastern Colorado.<sup>99</sup> The "Colorado Ground Water Management Act"<sup>100</sup> (Colorado Act) requires groundwater users to apply for permits from the Colorado Ground Water Commission (Commission).<sup>101</sup> To obtain such permits in Colorado, applicants must prove that they will apply the water to a beneficial use<sup>102</sup> and that the proposed use will not waste groundwater or unreasonably affect the rights of other groundwater users.<sup>103</sup> The Colorado Act defines waste as "causing, suffering, or permitting any well to discharge water unnecessarily above or below the surface of the ground."<sup>104</sup> The Colorado Act further provides for penalties in cases where groundwater users are found to be committing waste.<sup>105</sup>

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97. *Id.* at 47.

98. *See supra* note 33 and accompanying text.

99. Massey & Sloggett, *supra* note 4, at 380. (map of the Ogallala).

100. COLO. REV. STAT. §§ 37-90-101 to -141 (1973).

101. *Id.* § 37-90-107 (1973). *See generally* Jackson v. Colorado, 294 F. Supp. 1065 (D. Colo. 1968); North Kiowa-Bijou Management Dist. v. Ground Water Comm'n, 180 Colo. 313, 505 P.2d 377 (1973).

102. COLO. REV. STAT. § 37-90-107(1) (1978).

103. *Id.* § 37-90-107(5). *See also* Fundingsland v. Colorado Ground Water Comm'n, 171 Colo. 487, 468 P.2d 835 (1970).

104. COLO. REV. STAT. § 37-90-103(20) (1973).

105. *Id.* § 37-90-138. The Colorado Act provides that:

(1) The state engineer in cooperation with the commission has power to regulate the drilling and construction of all wells in the state of Colorado to the extent necessary to prevent the waste of water . . . .

(2) If the state engineer finds any well to have been drilled or maintained in a manner or condition contrary to any of the provisions of this article . . . he shall immediately notify



In *Fundingsland v. Colorado Ground Water Commission*,<sup>106</sup> the Colorado Supreme Court indicated that the Colorado Act requires the Commission to deny applications for drilling groundwater wells when the applicant's proposed use "will unreasonably impair existing water rights from the same source, or will create unreasonable waste."<sup>107</sup> The court maintained that the Colorado Act provides the following criteria for determining when waste will occur: (1) the location of the proposed well; (2) the geologic condition of the area; (3) the average recharge rate of the location's groundwater supply; (4) the priority and number of existing persons using the groundwater from the same source; (5) the applicant's proposed method of using the water; and (6) other appropriate matters to such questions.<sup>108</sup> It is questionable whether application of this vague test would classify the use of groundwater in secondary oil recovery operations as waste.

## 2. Kansas

The "Kansas Groundwater Exploration and Protection Act"<sup>109</sup> (Kansas Act) does not define waste. However, like Oklahoma groundwater users, Kansas groundwater users must also apply for permits.<sup>110</sup> Applications for permits are submitted to the state's chief engineer<sup>111</sup> who takes three factors into consideration when deciding whether to grant a permit. First, the application to drill a well for groundwater must be made in good faith.<sup>112</sup> Second, the groundwater applicant's proposed use must be beneficial.<sup>113</sup> Third, the Kansas Act does not require the applicant to prove that waste will not occur, but does require that a proposed use not "impair a use under an existing water right nor prejudicially and unreasonably affect the public interest."<sup>114</sup>

The oil industry is as important to Kansas' economy as it is to Oklahoma's economy. Unlike oil lessees in Oklahoma, Kansas oil lessees only have to show that a proposed use of groundwater is beneficial and

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the user in writing of such violation and give him such time as may reasonably be necessary . . . to correct deficiencies.

*Id.*

106. 171 Colo. 487, 468 P.2d 835 (1970).

107. *Id.* at 488, 468 P.2d at 836.

108. *Id.*

109. KAN. STAT. ANN. §§ 82a-1201 to -1215 (1977).

110. *Id.* § 82a-709.

111. *Id.* § 82a-709.

112. *Id.* § 82a-711 (Supp. 1983).

113. *Id.*

114. *Id.*

not that the use will not be waste. However, Kansas oil lessees must be able to show that the land (i.e., the leased property) is a real property interest for purposes of the Kansas Act.<sup>115</sup> Unfortunately, the Kansas Act does not contain a definition of land<sup>116</sup> and there are no Kansas cases determining whether an "oil and gas lease is a real property interest for the purpose of the water appropriation statutes."<sup>117</sup>

### 3. Nebraska

The "Nebraska Ground Water Management and Protection Act"<sup>118</sup> (Nebraska Act) only requires permits of groundwater users in "control or management areas."<sup>119</sup> Permits in control areas will be denied to users when: (1) a proposed well's operation or location will conflict with district regulations or controls; (2) a proposed water use will not be a beneficial use of water for domestic, agricultural, manufacturing, or industrial purposes; or (3) applicants submitting late permits did not act in good faith because they failed to submit their applications in the requisite amount of time.<sup>120</sup> Therefore, applicants for groundwater permits in Nebraska do not have to show that their proposed use will not waste groundwater. The Nebraska Act only requires that groundwater users prevent inefficient or improper runoff of the water to conserve groundwater supplies.<sup>121</sup>

### 4. New Mexico

New Mexico is an extremely dry state with desert areas receiving an annual precipitation of only eight inches and mountain areas receiving as much as thirty inches.<sup>122</sup> Precipitation is so low that New Mexico's agricultural economy is dependent on groundwater.<sup>123</sup> To preserve New

115. *Id.* § 82a-708a. The statute requires that "[a]ny rights to the beneficial use of water perfected under such application shall attach to the lands on or in connection with which the water is used . . . ." *Id.* (emphasis added). See also Neufeld, *The Kansas Water Appropriation Statutes and Their Effect Upon the Oil and Gas Industry in Kansas*, 50 J. KAN. B.A. 43 (1981).

116. Neufeld, *supra* note 115, at 50.

117. Neufeld, *supra* note 115, at 54.

118. NEB. REV. STAT. §§ 46-656 to -690 (1984).

119. *Id.* § 46-659. A control or management area is "any area so designated by the director following a public hearing initiated and conducted pursuant to section 46-658." *Id.* § 46-657(9). The director in Nebraska is the Director of Nebraska Water Resources. *Id.* § 46-657(7).

120. *Id.* § 46-660.

121. *Id.* § 46-664.

122. Comment, *New Mexico's Mine Dewatering Act: The Search for Rehoboth*, 20 NAT. RESOURCES J. 653 (1980).

123. *Id.*

Mexico's large groundwater reserve,<sup>124</sup> the New Mexico legislature has enacted the "Underground Waters Act"<sup>125</sup> (New Mexico Act). Beneficial use is the standard for determining the right to receive groundwater permits under this statute.<sup>126</sup> The New Mexico Act does not expressly include waste as a consideration for deciding when to issue permits. However, New Mexico case law indicates that a determination of whether waste will occur should be included in analyses of when proposed uses are beneficial.<sup>127</sup> The New Mexico Act grants permits when, "the proposed appropriation would not impair existing water rights from the same source, is not contrary to conservation of water within the state and is not detrimental to the public welfare of the state."<sup>128</sup>

In the only New Mexico case concerning waste, *State ex rel. Erickson v. McLean*,<sup>129</sup> the New Mexico Supreme Court analyzed the issue concerning whether McLean's use of groundwater for irrigation purposes was beneficial.<sup>130</sup> When the case was tried in a lower court, a witness claimed that

he was acquainted with [McLean's water] well; that as far as he knew, he did not remember anybody farming that place right at that time but it was a flowing well and that the water was flowing out; and that as far he knew, it was just running out on the grass; and that he did not know how much of the area was covered with the water but knew that the water was running all over the place.<sup>131</sup>

The court concluded that under New Mexico law, such excessive diversion of groundwater was waste and not beneficial.<sup>132</sup>

124. *Id.* New Mexico's groundwater reserves have been estimated by the U.S. Geological Survey to be at 20 billion acre-feet. *Id.*

125. N.M. STAT. ANN. §§ 72-12-1 to -28 (1978).

126. *Id.* § 72-12-2. *See generally* *State ex rel. Erickson v. McLean*, 62 N.M. 264, 308 P.2d 983 (1957).

127. *See generally* *State ex rel. Erickson v. McLean*, 62 N.M. 264, 308 P.2d 983 (1957).

128. N.M. STAT. ANN. § 72-12-3(E) (1978). *See also* *Stokes v. Morgan*, 101 N.M. 195, 680 P.2d 335 (1984) (change in water quality results in strong inference of impairment); *City of Roswell v. Berry*, 80 N.M. 110, 452 P.2d 179 (1969) (in reviewing applications, state engineer has duty to determine impairment of existing rights); *McBee v. Reynolds*, 74 N.M. 783, 399 P.2d 110 (1965) (applicants bear the burden of proving the availability of unappropriated water and that granting their application will not result in impairment of existing rights); *Templeton v. Pecos Valley Artesian Conservancy Dist.*, 65 N.M. 59, 332 P.2d 465 (1958) (only permits for unappropriated waters can be granted).

129. 62 N.M. 264, 308 P.2d 983 (1957).

130. *Id.* at 265, 308 P.2d at 984.

131. *Id.* at 267, 308 P.2d at 985.

132. *Id.* at 269, 308 P.2d at 987. The court stated that:

The law contemplates an economical use of artesian water. It will not countenance the diversion of a volume from an artesian well which, by reason of waste resulting from permitting it to run uncontrolled for twenty four hours a day over grazing lands without an irrigation system, or through pipes to water troughs fitted with float feeds or other means of control to prevent waste therefrom, is many times that which is actually consumed for a

There do not appear to be any reported cases of conflicts between groundwater conservation and use of groundwater in secondary oil recovery operations. Nevertheless, "[i]ntensive uranium mining in the northwestern quadrant of the state has caused increasingly difficult conflicts in the management of groundwater resources in that area."<sup>133</sup> Even though this conflict is principally controlled by the terms of the New Mexico Mine Dewatering Act,<sup>134</sup> the method used by New Mexico lawmakers in resolving this problem could carry over to possible later disputes involving oil companies wanting to use groundwater in secondary oil recovery operations.

## 5. Texas

Individual conservation districts (districts), under the Texas Water Code<sup>135</sup> (Texas Code) regulate groundwater use in Texas.<sup>136</sup> Texas, like other Ogallala states, requires groundwater users to obtain permits prior to drilling or altering a water well.<sup>137</sup> Districts are to issue the permits and control the number of groundwater wells drilled "[i]n order to minimize as far as practicable the drawdown of the water table or the reduction of artesian pressure, or to *prevent waste*. . . ."<sup>138</sup> Under the Texas

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useful or beneficial use. Water is too valuable to be wasted, either through an extravagant application for the purpose appropriated or by waste by misapplication which can be avoided by the exercise of a reasonable degree of care to prevent loss, or loss of a volume which is greatly disproportionate to that actually consumed.

*Id.*

133. Comment, *supra* note 122, at 653.

134. 1980 N.M. Laws, Ch. 148, § 2(B). The New Mexico legislature passed the Mine Dewatering Act to "promote maximum economic development of mineral resources while ensuring that such development does not impair existing prior water rights." Comment, *supra* note 122, at 661.

135. TEX. WATER CODE ANN. §§ 52.001 - 52.401 (Vernon 1972).

136. *Id.* § 52.021. The purpose of these districts is, "to provide for the conservation, preservation, protection, recharging, and prevention of waste of the underground water of underground water reservoirs or their subdivisions, consistent with . . . the Texas Constitution." *Id.*

137. *Id.* § 52.116. The Code states that "[d]rilling a well without a required permit or operating a well at a higher rate of production than the rate approved for the well is declared to be illegal, wasteful per se, and a nuisance." *Id.* § 52.120(a). See *Friendswood Dev. Co. v. Smith-Southwest Indus.*, 576 S.W.2d 21 (Tex. 1978) (groundwater users may be liable for negligent withdrawal of groundwater from wells). See generally Teutsch, *Controls and Remedies for Ground Water-Caused Land Subsidence*, 16 HOUS. L. REV. 283 (1979).

138. TEX. WATER CODE ANN. § 52.117 (Vernon 1972) (emphasis added). Permits may be required for:

the drilling, equipping, or completing of wells, or for substantially altering the size of wells or well pumps, or for all of these operations. Permits may be issued subject to the rules made under Section 52.117 of this code and subject to terms and provisions with reference to the drilling, equipping, completion, or alteration of wells or pumps that may be necessary to conserve the underground water, prevent waste, minimize as far as practicable the drawdown of the water table or the reduction of artesian pressure, or lessen interference between wells.

*Id.* § 52.114.

Code, the districts also have a duty to regulate spacing and production of groundwater wells.<sup>139</sup>

The language of the Texas Code indicates that the districts must consider whether an applicant's proposed use is beneficial and whether waste will occur before issuing groundwater permits. The Texas Code definition of waste includes use which is not for a beneficial purpose,<sup>140</sup> but does not say whether use of groundwater in secondary oil recovery operations is waste.<sup>141</sup> However, the statute does clarify what is meant by "beneficial use."<sup>142</sup> According to Texas law, "exploring for, producing, handling, or treating oil, gas, sulphur, or other minerals" is a beneficial use.<sup>143</sup> Therefore, even though the Texas Code does not explicitly say that use of groundwater in secondary oil recovery operations is not waste, it does say that such use is a permitted beneficial use which in turn allows districts to issue oil companies groundwater use permits.

#### IV. ANALYSIS

Under the Oklahoma Groundwater Law (Oklahoma Law), groundwater permit applicants must prove that their proposed use of groundwater is beneficial and not waste.<sup>144</sup> Unlike the Texas Code, the Oklahoma Law fails to explain what is meant by beneficial use of groundwater.<sup>145</sup> In addition, while the Oklahoma Law does not define waste, it

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139. *Id.* § 52.117.

140. *Id.* § 52.001(6). The Texas Code defines waste as:

- (A) withdrawal of underground water from an underground water reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;
- (B) the flowing or producing of wells from an underground water reservoir if the water produced is not used for a beneficial purpose;
- (C) escape of underground water from an underground water reservoir to any other reservoir that does not contain underground water;
- (D) pollution or harmful alteration of underground water in an underground water reservoir by salt water, other deleterious matter admitted from another stratum or from the surface of the ground; or
- (E) willfully causing, suffering, or permitting underground water to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road or road ditch, or onto any land other than that of the owner of the well.

*Id.* But see Johnson, *The Continuing Voids in Texas Groundwater Law: Are Concepts and Terminology to Blame?*, 17 ST. MARY'S L.J. 1281, 1283 (1986). Critics of the Texas Code allege that it provides inadequate sanctions against waste.

141. TEX. WATER CODE ANN. § 52.001(6) (Vernon 1972).

142. *Id.* § 52.001(7).

143. *Id.* § 52.001(7)(B).

144. See *supra* notes 19-21 and accompanying text.

145. OKLA. STAT. tit. 82, § 1020.9 (1981). This section requires a proposed use to be beneficial, but does not explain what is meant by the term "beneficial use."

does list several examples of uses which do constitute waste.<sup>146</sup> Nevertheless, the Oklahoma Law fails to express whether groundwater use in secondary oil recovery operations is waste.<sup>147</sup> The Oklahoma Supreme Court also refuses to determine whether such use is waste. Instead, the court merely says that use of groundwater in secondary recovery operations is not "per se waste"<sup>148</sup> and that it is the Oklahoma Water Resources Board's duty to determine when a proposed use is waste.<sup>149</sup> After taking into consideration the approaches of other Ogallala states and the fact that groundwater is becoming increasingly scarce, should Oklahoma lawmakers continue to require applicants for groundwater permits, such as oil companies, to prove that their proposed use of the water is not waste?

Not all Ogallala states require groundwater users to prove that their proposed use will not be waste before they can obtain groundwater permits.<sup>150</sup> Several states take an alternative approach. The best approach is to focus not on whether the use is beneficial *and* not waste, but instead to focus only on whether the proposed groundwater use is beneficial. This test is easier for courts to apply and state lawmakers can still discourage waste by requiring courts to prosecute groundwater users who commit waste. For example, in the New Mexico case, *State ex rel. Erickson v. McLean*,<sup>151</sup> a defendant groundwater user allowed his well to flow uncontrolled twenty-four hours a day.<sup>152</sup> The New Mexico Supreme Court concluded that the defendant was committing waste and was thus subject to reprimand.<sup>153</sup> In the Texas case, *Friendswood Development*

146. *Id.* § 1020.15.

147. *Id.*

148. *See supra* notes 54-58, 69-75 & 84-97 and accompanying text.

149. *See supra* notes 85-92 and accompanying text.

150. *See supra* notes 114, 120-21 & 126-28 and accompanying text. *See also* Massey & Sloggett, *supra* note 4, at 379. The Ogallala states on the whole have taken similar approaches to promote conservation of groundwater and prevent its waste. The most common methods of regulation include:

- (1) Permits issued by a governmental agency giving permission to drill wells or use groundwater;
- (2) Well spacing requirements specifying distances among wells to prevent interference among them;
- (3) Quantity restrictions limiting the amount pumped from a well; and
- (4) Controls preventing the waste of groundwater during use.

All these controls have not been adopted by each of the management agencies in the Ogallala area. Some agencies have adopted only one, while others have adopted several of the available controls.

Massey & Sloggett, *supra* note 4, at 396.

151. 62 N.M. 264, 308 P.2d 983 (1957).

152. *Id.* at 272, 308 P.2d at 988.

153. *Id.* at 274, 308 P.2d at 989.

*Co. v. Smith-Southwest Industries*,<sup>154</sup> a defendant groundwater user withdrew such vast quantities of underground water that it caused the plaintiff's land to subside.<sup>155</sup> The plaintiff was allowed to collect damages from the defendant on the grounds of negligence.<sup>156</sup> The Texas Supreme Court concluded that "if [a] landowner's manner of withdrawing ground water from his land is negligent, willfully wasteful, or for the purpose of malicious injury, and such conduct is a proximate cause of the subsidence of the land of others, he will be liable for the consequences of his conduct."<sup>157</sup> If groundwater users, such as farmers and oil companies, know that they will be liable for damages or heavily fined, they will in most cases be deterred from carrying on wasteful practices. Monetary punishment must be great enough, however, to make the cost of committing waste outweigh its benefits.

The Oklahoma Law currently provides for prosecution of groundwater users who engage in waste.<sup>158</sup> The statute does not need to include separate sections: one requiring groundwater permit applicants to prove that their proposed use will not be waste and the other providing for prosecution of users engaging in waste. If sanctions were made more stringent, the prosecution section alone could suffice in guarding against wasteful practices in using groundwater. Presently, the prosecution section calls for permit revocation upon discovery of waste.<sup>159</sup> A provision should also be included for fines.

Another possible route that Oklahoma lawmakers could take would be to follow the approach of Colorado,<sup>160</sup> Kansas,<sup>161</sup> and New Mexico<sup>162</sup> which forbids issuing a groundwater permit to an applicant who proposes a use which would harm an already existing use from the same source. The Oklahoma Law currently contains a section that protects groundwater users who had rights to use groundwater prior to the enactment of the statute.<sup>163</sup> However, the test for a groundwater permit does not require groundwater permit applicants to prove that a proposed use

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154. 576 S.W.2d 21 (Tex. 1978).

155. *Id.* at 21-22.

156. *Id.* at 30.

157. *Id.*

158. OKLA. STAT. tit. 82, § 1020.15 (1981). See *supra* note 58 and accompanying text.

159. *Id.*

160. See *Fundingsland v. Colorado Ground Water Comm'n*, 171 Colo. 487, 488, 468 P.2d 835, 836 (1970). Law requires denial of a permit when "the proposed appropriation will unreasonably impair existing water rights from the same source." *Id.*

161. See *supra* note 114 and accompanying text.

162. See *supra* note 128 and accompanying text.

163. OKLA. STAT. tit. 82, § 1020.14 (1981).

will not impair an already existing right to use groundwater from the same source. If the Oklahoma statute included such a section, it would help settle disputes as to which users will be given permits as the groundwater supply diminishes. Under this approach, an applicant for a permit, such as an oil company, would have to prove that the use of fresh groundwater in secondary oil recovery operations would be a beneficial use and that it would not harm an already existing use from the same source (i.e., a farmer who uses fresh groundwater for irrigation).

Despite the Oklahoma Law's inclusion of a waste section which has an example list of wasteful uses, it is inadequate for resolving issues such as whether use of fresh groundwater in secondary oil recovery operations is waste.<sup>164</sup> The inadequacy arises because the Oklahoma Law's definition includes a section providing that "[t]aking or using fresh groundwater in any matter so that the water is lost for beneficial use" is waste of groundwater.<sup>165</sup> For example, when groundwater is used for agricultural irrigation, the water mixes with chemicals from fertilizers, rendering it unfit for further use.<sup>166</sup> In addition, when groundwater is injected into a mineral formation for waterflooding operations, it is again permanently lost, thus preventing further beneficial uses. Therefore, it is difficult to imagine very many uses of groundwater that do not cause it to be lost for further beneficial uses. To remedy this problem, the Oklahoma Law should be more specific as to what is meant by "lost for beneficial use" and what is meant by "waste." Clarification would guide the Board and the courts in enforcing the statutory provisions prohibiting waste.

The Oklahoma Law should also prioritize groundwater uses so that a certain amount is safely set aside for drinking water and domestic use. The groundwater should then be apportioned among all other uses such as irrigation and secondary oil recovery operations. The Oklahoma Law does not require permits for domestic use, but this alone does not guarantee that a certain amount of water will be set aside for such use.<sup>167</sup>

The controversy over the use of fresh groundwater in secondary oil

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164. *Id.* § 1020.15.

165. *Id.* § 1020.15(3).

166. *See supra* p. 681.

167. OKLA. STAT. tit. 82, § 1020.3 (1981). This section provides that "[a]ny landowner has a right to take groundwater from land owned by him for domestic use without a permit. Wells for domestic use shall not be subjected to well spacing orders, but are subject to sanctions against waste." *See also* *Hodges v. Oklahoma Water Resources Bd.*, 48 OKLA. B.J. 31 (1976) (discussion as to whether Oklahoma legislature intended by not requiring permits for domestic use that such use be given priority).



recovery operations could be reduced if Oklahoma lawmakers would follow the Texas Code's approach which includes a provision expressly classifying such use as beneficial.<sup>168</sup> Oklahoma lawmakers should make a decision as to whether groundwater use in secondary recovery operations is beneficial or waste. The best approach is to conclude that use of groundwater in secondary oil operations is beneficial and not waste because to conclude otherwise will cause Oklahoma to lose economic benefits by failing to recover the maximum amount of petroleum.<sup>169</sup> Furthermore, simply because Oklahoma ceases to use groundwater in secondary recovery operations does not mean that other Ogallala oil producing states will. Even if Oklahoma stops using groundwater for oil recovery operations, use of the Ogallala's supply by other states could still cause the limited resource to become depleted. Therefore, Oklahoma should try to reap maximum economic benefits from groundwater while at the same time seeking to protect its dwindling supply. Oklahoma should also engage in extensive research to find ways of replenishing the Ogallala's resources.

## V. CONCLUSION

As groundwater becomes increasingly scarce, competition will grow between various users, including oil companies and farmers. Currently, Oklahoma groundwater applicants must prove that their proposed use of the water is beneficial and not waste in order to obtain a permit. The Oklahoma Law does not expressly say whether use of groundwater in secondary oil recovery operations is beneficial or even whether it is waste.

A better approach would be a two-pronged test requiring users to prove that the proposed use is beneficial and that it would not impair an already existing water use from the same source. Proof that waste will not occur should not be a prerequisite for obtaining a permit. Nevertheless, the Oklahoma Law should retain its provisions requiring prosecution of users who commit waste, provided that such provisions impose more stringent sanctions against wasteful practices.

The Oklahoma Legislature should prioritize water rights so that a certain amount is set aside for drinking water and domestic use. The

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168. See *supra* note 140-43 and accompanying text.

169. See *Sun Oil Co. v. Whitaker*, 483 S.W.2d 808 (Tex. 1972) (Daniel, J., dissenting), where it is pointed out that groundwater "is particularly important in a State whose most productive resources are oil and agriculture, both of which depend heavily upon declining sources of water." *Id.* at 817.

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remaining quantities should then be allocated among such uses as irrigation and oil recovery operations. Lastly, the Oklahoma Law should expressly classify use of groundwater in secondary oil recovery operations as beneficial, because to do otherwise would deprive Oklahoma's economy of the benefits reaped from maximum oil recovery.

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